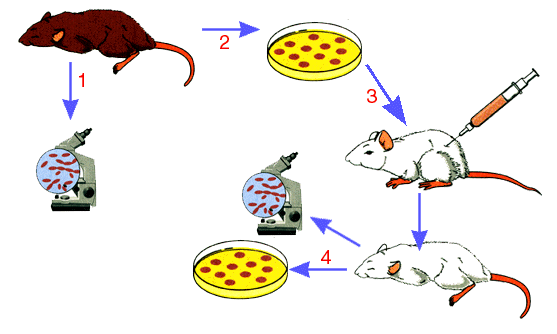
**Random Facts to Know for the SOL**

Ms. Ottolini, 2013-2014

**The Germ Theory and Koch’s Postulates:** *(Courtesy of Wikipedia and the Virginia Department of Education☺)*

* The germ theory of disease states that some diseases are caused by microorganisms. These small organisms, too small to see without magnification, invade humans, animals, and other living hosts. Their growth and reproduction within their hosts can cause a disease.
* "Germ" may refer to a virus, bacterium, protist, fungus, or prion (an infectious protein). Microorganisms that cause disease are called pathogens, and the diseases they cause are called infectious diseases.
* Even when a pathogen is the principal cause of a disease, environmental and hereditary factors often influence the severity of the disease, and whether a particular host individual becomes infected when exposed to the pathogen.
* Experiments related to the germ theory were conducted by Robert Koch, who isolated the bacteria Vibrio cholera, the cause of cholera, from water taken from Germany’s Elbe River, thus proving the relationship between polluted water and this disease. Koch went on to formulate an established set of procedures to isolate and identify the microorganism causing a particular infectious disease. The following four steps, which are still used today, are known as Koch’s Postulates:



Postulate 1: A specific organism must always be observed in association with the disease.

Postulate 2: The organism must be isolated from an infected host and grown in pure culture in the laboratory.

Postulate 3: When the organism from the pure culture is inoculated into a susceptible host organism, it must cause the disease.

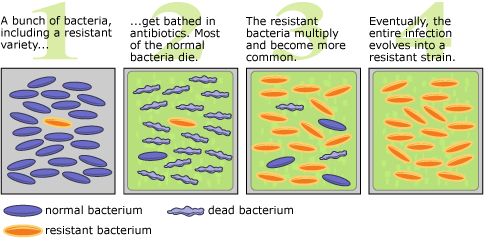
Postulate 4: The infectious organism must be re-isolated from the diseased organism and grown in pure culture.

**Human Body Systems:**

* I check the Virginia Biology SOL Test Blueprint, and there are no questions about human body systems on the new SOL (since 2013)… YAY!

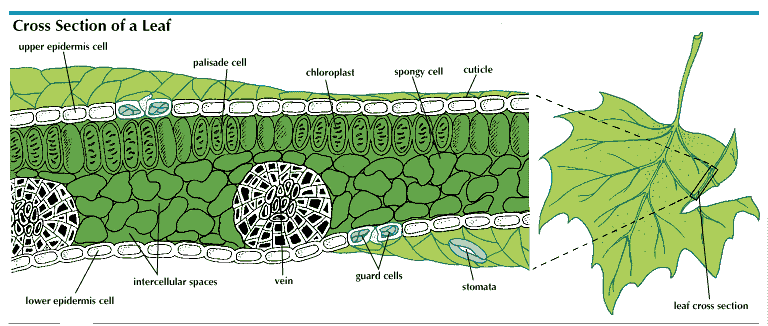
**Evolution of Antibiotic Resistance:**

* Most bacteria are susceptible to antibiotics, but some are naturally resistant due to random, beneficial antibiotic-resistance mutations in their DNA.
* Susceptible bacteria are killed by antibiotics, but resistant bacteria survive and reproduce. This results in the increasing frequency of bacterial infections that cannot be successfully treated with antibiotics.

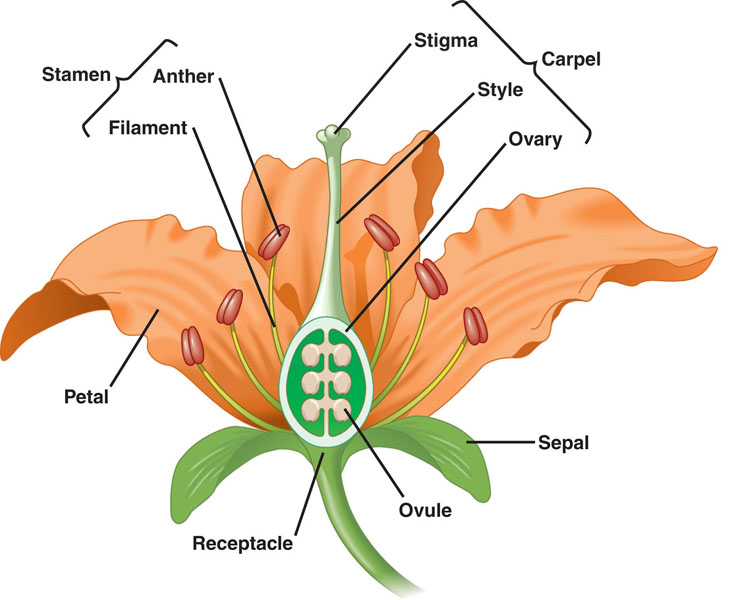


**Plant Anatomy:**

* Root system – used to anchor the plant and absorb water / nutrients (ex: nitrates and phosphates) from the soil.
* Stem—used to transport water up from the roots to the leaves by capillary action and to transport sugars created during photosynthesis from the leaves throughout the rest of the plant. There are two types of “vascular tissue” (tubes) in the plant to transport materials—xylem to transport water and phloem to transport sugars.
* Leaves—used to capture sunlight to create glucose (photosynthesis) and to take in carbon dioxide / release carbon dioxide through holes on the underside of the leaf called stomata. Water also evaporates out of the leaf through the stomata in a process called transpiration.
* Epidermis covers the outer surface of the leaves and stem, providing a protective layer.



**Angiosperms vs. Gymnosperms:**

* Angiosperms and gymnosperms (aka Conifers) are two types of vascular plants (i.e. plants with stems, and therefore vascular tissue)
* A gymnosperm is a vascular plant that produces seeds lacking an outer fruit. Normally these seeds are contained in cones.
* An angiosperm is a vascular plant that produces seeds located inside a fruit. This type of plant also has flowers where pollination occurs when the male gamete (pollen) detaches from the male part of the flower (anther), attaches to the female part (stigma), and travels through the stigma into the ovary to fertilize the egg. Fruits are ripened / mature ovaries with fertilized eggs (i.e. seeds).